

142,879

PATENT



SPECIFICATION

Application Date, May 17, 1918. No. 8311/18.

Complete Left, Oct. 24, 1918.

Accepted, Dec. 10, 1918 (but withheld from Publication under Section 30 of Patents and Designs Acts, 1907 and 1919.)

Authorised to be Published, Apr. 22, 1920. Date of Publication, June 10, 1920.

PROVISIONAL SPECIFICATION.

Improvements in and relating to the Production and Utilisation of Sulphur Dichloride.

We, WILLIAM JACKSON POPE, C.B.E., F.R.S., Chemist, and CHARLES THOMAS HEYCOCK, F.R.S., Chemist, both of The Chemical Laboratory, University of Cambridge, in the County of Cambridge, do hereby declare the nature of this invention to be as follows:—

- 5 This invention relates to the production and utilisation of sulphur dichloride SCl_2 .

It is well known that on passing chlorine into sulphur monochloride, S_2Cl_2 , combination does not occur immediately, and that if the operation is performed with the sulphur chloride cooled to a low temperature as, for instance, by the
10 employment of a freezing mixture, a large proportion of the dissolved chlorine is given off as gas, when the solution is allowed to warm up. In order that a satisfactory conversion of sulphur monochloride into dichloride may be obtained, it has, therefore, been found necessary to preserve the mixture produced by dissolving chlorine therein for some time at a suitably low temperature.

- 15 The invention is based upon the observation that by the employment of suitable catalysts the reaction between the chlorine and the sulphur monochloride may be expedited.

Absorbent charcoal has been found to be particularly suitable for the purpose in view, and consequently in manufacturing sulphur dichloride in accordance
20 with the present invention, chlorine may be passed into the sulphur monochloride in the presence of absorbent charcoal.

When sulphur dichloride is subjected to conditions as, for instance, in chemical operations which lead to its decomposition into sulphur monochloride and chlorine, to facilitate the recombination of the chlorine and sulphur
25 monochloride, a suitable catalyst such as absorbent charcoal may, in accordance with the invention, be made use of.

Thus, when sulphur dichloride is heated to a temperature above the normal atmospheric temperature, it is largely decomposed into sulphur monochloride and chlorine, and, in accordance with the invention, a suitable catalyst such
30 as absorbent charcoal may be made use of for hastening the recombination.

Dated this 17th day of May, 1918.

MARKS & CLERK,

COMPLETE SPECIFICATION.

Improvements in and relating to the Production and Utilisation of Sulphur Dichloride.

We, WILLIAM JACKSON POPE, C.B.E., F.R.S., Chemist, and CHARLES THOMAS HEYCOCK, F.R.S., Chemist, both of The Chemical Laboratory, University of Cambridge, in the County of Cambridge, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:— 5

This invention relates to the production and utilisation of sulphur dichloride SCl_2 .

It is well known that on passing chlorine into sulphur monochloride, S_2Cl_2 , combination does not occur immediately, and that if the operation is performed with the sulphur chloride cooled to a low temperature as, for instance, by the employment of a freezing mixture, a large proportion of the dissolved chlorine is given off as gas, when the solution is allowed to warm up. In order that a satisfactory conversion of sulphur monochloride into dichloride may be obtained, it has, therefore, been found necessary to preserve the mixture produced by dissolving chlorine therein for some time at a suitably low temperature unless 15 catalysts are employed for facilitating the reaction.

The invention is based upon the observation that by the employment of absorbent charcoal the reaction between the chlorine and the sulphur monochloride may be expedited, and that this material is considerably superior to the catalysts hitherto proposed to be used for the purpose in view. 20

Consequently in manufacturing sulphur dichloride from sulphur monochloride and chlorine in accordance with the present invention, chlorine is passed into the sulphur monochloride in the presence of absorbent charcoal.

When sulphur dichloride is subjected to conditions as, for instance, in chemical operations which lead to its decomposition into sulphur monochloride and chlorine, to facilitate the recombination of the chlorine and sulphur monochloride, a suitable catalyst such as absorbent charcoal may, in accordance with the invention, be made use of. 25

Thus, when sulphur dichloride is heated to a temperature above the normal atmospheric temperature, it is largely decomposed into sulphur monochloride and chlorine, and, in accordance with the invention, absorbent charcoal may be made use of for hastening the recombination. 30

The following particulars are given by way of example to illustrate a suitable method of carrying the invention into effect:—

Sulphur monochloride is introduced into a suitable vessel, which is conveniently made of lead or earthenware, together with a small proportion, say about one *per cent.*, by weight, of well dried finely powdered highly absorbent charcoal. Chlorine gas is then passed into the liquid mixture of sulphur monochloride and charcoal until a sufficient amount has been dissolved to convert the sulphur monochloride wholly into sulphur dichloride. The containing vessel is conveniently provided with cooling devices for absorbing the large amount of heat liberated during the reaction, and is conveniently fitted with gauge glasses so that the operator can observe when a sufficient amount of chlorine has been added by noting the increase of volume. Each 1000 parts by volume of sulphur monochloride is capable of yielding about 1590 parts by 45 volume of sulphur dichloride.

The addition of chlorine may also be checked by weighing the containing vessel before and after the introduction of the sulphur monochloride and of the

chlorine. Each litre of sulphur monochloride weighs about 1690 grams and gives about 2580 grams of sulphur dichloride. Inasmuch as the sulphur monochloride used is not necessarily pure, it is, in general, convenient to determine the increase of volume or of weight which attends the conversion of each sample of sulphur monochloride into sulphur dichloride and to regulate the works practice accordingly.

Having now particularly described and ascertained the nature of our said invention and in what manner the same is to be performed, we declare that what we claim is:—

- 10 1. The process for the production of sulphur dichloride SCl_2 which comprises the employment of absorbent charcoal for facilitating or expediting the reaction between the chlorine and the sulphur monochloride.
2. The process as claimed in Claim 1, in which absorbent charcoal, is made use of for facilitating the recombination of the chlorine and sulphur monochloride produced by the decomposition of sulphur dichloride.
- 15 3. The process of producing sulphur dichloride by the employment of absorbent charcoal, substantially as described.

Dated this 24th day of October, 1918.

MARKS & CLERK.